REMARKS

Claim 1 has been amended to include the limitations of Claim 3 and 7. Claims 3 and 7 have been cancelled as redundant. The following addresses the substance of the Office Action.

Non-obviousness

The Examiner has rejected claims 1-11 under 35 USC §103(a) as being allegedly unpatentable over EP1195219 in view of Lindstrom (USP 6,198,068). Specifically, the Examiner stated that it would have been obvious at the time the invention was made to modify the EP system to include zinc based wire filler in conjunction with plasma welding, to provide an effective and strong weld of the claimed materials.

The presently claimed invention relates to a method for inert gas welding or inert gas soldering of material workpieces by using a zinc-based alloy as soldering metal. Inert gas welding is a process which is defined in paragraph [0005] of the specification. The workpiece is welded by means of arc burning between a wire electrode and a flow of inert gas and the workpiece. The wire electrode may include welding additives and has to be adjusted to the material to be welded.

The second method is the metal inert gas soldering which differs from the metal inert gas welding only by the fact that a solder melting lower than the base material to be joined is used as a wire electrode so that the entire process can be carried out at lower temperatures (see paragraph [0007]).

The cited EP document which is equivalent to US 2002/0050487 (Schwankhart) does not relate to a method for inert gas welding or inert gas soldering of workpieces. The cited document describes joining the workpieces by using a mechanical connection. This is described in paragraph col. 1, lines 22-24 of the reference which states that the usual procedure is to produce a joint with mechanical methods such as edge-forming and to fill up any remaining gaps in the joint with glues in order to strengthen the joint. After the two workpieces are joined, the joining seam is filled with an additional material by melting it to melting temperature by a plasma jet. The cited reference does not teach or suggest the electric arc soldering or welding. The cited art also does not teach or suggest that the workpieces are joined using additional metal alloys, the melting temperatures of which range from 370 to 600°C.

US 6,198,068 (Lindstrom) describes a method of brazing with the use of a plasma-forming device having an electrode. Furthermore, a protective gas is used. However, according to column 2, lines 5 - 9 of the Lindstrom document the used braze material comprises copper as principal component and a minor amount of Al, Si, and Sn. The document states that the braze workpieces are, for example, steel plates having a thickness of less than 4 mm. It is further stated in column 3, lines 61 to 63 that these steel plates may have a surface-coating layer which can be a protective thin metallic surface layer made from Zinc, aluminum or a mixture of these metals. However, it is not described in the document that a zinc alloy is used as solder material.

Therefore, a person skilled in the art would not be motivated combine the two documents because Schwankhart teaches plasma jet welding with zinc alloys, while Lindstrom describes the state of the art for plasma braze welding by using high temperature and copper-base materials as braze materials but does not teach person skilled in the art to use zinc or zinc alloys as soldering or welding metal.

The present specification describes several disadvantages that the use of copper-based materials has. Paragraph [0009] states that a melting point of these braze material is about 950 to 1,400°C. This means that the thermal load on the component parts is very high so that a distortion of the component parts may occur. A further disadvantage is that very thin metallic workpieces can not be soldered by using this method with a very high temperature. Furthermore, in the case of steel sheets comprising corrosion-protecting surface layers these surface layers may be destroyed if such high temperatures are used reducing the corrosion resistance of this steel sheet.

If the method of inert gas welding or inert gas soldering is carried out according to the claimed invention, the welding process can be carried out at much lower temperatures around 350 to 450°C so that the thermal load is lower (see paragraph [0015]). Because of the low temperatures it is also possible to join very thin materials such as bands or sheet metals having a thickness of less than 1 mm. A further advantage is that the corrosion layers are not destroyed during the joining process (also see page 5 of the application).

For all the above reasons, Applicant asserts that Claims 1-11 as currently amended are not obvious in view of Schwankhart and Lindstrom, and their rejection under 35 USC §103(a) should be withdrawn.

CONCLUSION

Applicants have endeavored to address all of the Examiner's concerns as expressed in the outstanding Office Action. Accordingly, amendments to the claims, the reasons therefor, and arguments in support of the patentability of the pending claim set are presented above. In light of the above amendments and remarks, reconsideration and withdrawal of the outstanding rejections is specifically requested. If the Examiner finds any remaining impediment to the prompt allowance of these claims that could be clarified with a telephone conference, the Examiner is respectfully requested to initiate the same with the undersigned.

Please charge any additional fees, including any fees for additional extension of time, or credit overpayment to Deposit Account No. 11-1410.

Respectfully submitted,

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